

(LESSONS LEARNED: SCREEN FROM PD21 WEB SITE SCREEN)

MASTER OF SCIENCE IN PRODUCT DEVELOPMENT, DISTRIBUTED LEARNING PROGRAM. PRODUCT DEVELOPMENT FOR THE 21ST CENTURY (PD21) IS A VIDEO TELECONFERENCING (VTC)-BASED PROGRAM ORIENTED TO DEFENSE MILITARY AND CIVILIAN WORKFORCE AS WELL AS DEFENSE CONTRACTOR EMPLOYEES

THE PD21 PROGRAM RECOGNIZES THE NEED FOR CONTINUOUS EVALUATION OF THE CHANGING REQUIREMENTS OF THE NAVY AND HAS A PROCESS IN PLACE TO ASSESS AND IMPLEMENT RECOMMENDATIONS TO PROVIDE THE HIGHEST QUALITY EDUCATION TO OUR FUTURE TECHNICAL LEADERS

PD21
LESSONS
LEARNED

MAKING A GREAT PROGRAM BETTER THROUGH CONTINUOUS RESPONSE TO CUSTOMER NEEDS

DISTANCE
LEARNING
LESSONS
LEARNED

TECHNOLOGY IMPROVEMENTS TO PROVIDE UP-TO-DATE COMMUNICATION CAPABILITIES

STUDENT
INPUT

STUDENT COMMENTS FROM THE 1ST YEAR OF THE PD21 PROGRAM

LESSONS LEARNED (BUTTON 1.1)

RELEVANCE

NEED ADVANCED EDUCATION, OF THE HIGHEST QUALITY, IN CONCEPTS, METHODOLOGIES, AND ANALYTICAL TECHNIQUES FOR SUCCESSFUL MANAGEMENT OF PROGRAMS/PROJECTS WITHIN COMPLEX ORGANIZATIONS, AND A NEED FOR QUICKER SYSTEM DELIVERY TO FLEET AND MORE EFFICIENT TECHNOLOGY SHARING

PD21 SOLUTION:

- COURSE OBJECTIVES ARE REGULARLY EVALUATED AND MODIFIED WHERE NEEDED TO PROVIDE A UNIQUE PROGRAM TO BETTER REFLECT PROVEN PROCESSES USED IN HIGH PERFORMANCE FIRMS
- FIELD TRIPS TO VARIOUS COMPANIES (BOTH MILITARY AND INDUSTRY) TO OBSERVE BEST BUSINESS PRACTICES

LESSONS LEARNED (BUTTON 1.2)

QUALITY

NEED FOR TRAINING IN PROBLEM-SOLVING AND DECISION-MAKING
WITHIN THE ACQUISITION ENVIRONMENT

PD21 SOLUTION: CURRICULA HAVE BEEN DESIGNED AND ARE
REGULARLY RE-EVALUATED TO ENSURE:

- NETWORKING OPPORTUNITIES ACROSS ACADEMIC
INSTITUTIONS THROUGH SYMPOSIA
- FOCUS ON UTILIZING CASE STUDIES, TEAMING EXERCISES,
HANDS-ON APPLICATIONS, ACTIVE PARTICIPATION – DIRECT
APPLICABILITY TO CURRENT TASKING
- LECTURE AND LABORATORY TASKS REQUIRE THE APPLICATION OF
CRITICAL THINKING TO PROBLEM SOLVING WITHIN ACTUAL
SITUATIONS
- KNOWLEDGE, SKILLS AND ABILITIES ARE PROVIDED TO THE
CIVILIAN TO MANAGE AND LEAD EFFECTIVELY
- INSTRUCTION IS PROVIDED BY PROFESSOR'S RECOGNIZED FOR
THEIR EXPERTISE AND FORWARD THINKING IN ACQUISITION
LEADERSHIP

LESSONS LEARNED (BUTTON 1.3)

CUSTOM OPTIONS

NEED FLEXIBILITY TO PROGRAM THAT ALLOWS ADJUSTMENTS IN CURRICULA WITHOUT IMPACT ON CONSISTENT QUALITY OF PROGRAM OVER TIME

PD21 SOLUTION: PROCESS IN PLACE TO BE RESPONSIVE TO NEEDS AS ISSUES ARISE. 360-DEGREE REVIEW OF PROGRAM PROVIDES CONTINUOUS INPUT FROM STUDENTS, FACULTY, AND SPONSORS RESULTING IN SEVERAL CHANGES DURING THE FIRST YEAR.

MODIFICATIONS HAVE INCLUDED:

- INCORPORATION OF WEB-BASED TOOL FOR COMMUNICATION AND COURSE MATERIAL DISTRIBUTION (COURSEINFO)
- CONTINUOUS REVIEW OF TECHNOLOGY AND EQUIPMENT UPGRADE TO ENSURE BEST POSSIBLE TWO-WAY INTERACTIVE AUDIO AND VIDEO BETWEEN THE DISTANCE SITES AND NPS CLASSROOMS
- REFINEMENT OF ACADEMIC TRACKS TO MEET NEEDS OF SPONSORS/STUDENTS AND PROVIDE IMMEDIATE APPLICABILITY TO WORK TASKS **??HOT ADDRESS TO CURRICULA??**

LESSONS LEARNED
(BUTTON 1.4)

MINIMAL JOB INTERFERENCE

NEED MINIMAL IMPACT TO TIME AWAY FROM DUTY OF RECORD

PD21 SOLUTION: DURING THE FIRST YEAR CLASS MEETING TIMES
HAVE BEEN MODIFIED TO:

- ALLOW CLASS AT TIMES ESTABLISHED TO CONSIDER STUDENT WORK SCHEDULES AND TIME ZONES OF VARIOUS LOCATIONS
- UTILIZE VIRTUAL TEAMING ON VARIOUS CLASS ASSIGNMENTS ENHANCE THE STUDENT EXPERIENCE THROUGH DIVERSITY OF TECHNICAL BACKGROUNDS, PERSONALITIES, AND WORK STYLES
- INVESTIGATE FLEXIBILITY OF ASSIGNMENTS, WHEN POSSIBLE TO INCLUDE DUTY OF RECORD TASKING WHEN APPROPRIATE HELPING TO KEEP PROJECTS ON SCHEDULE AND PROVIDE REAL WORK APPLICATION

LESSONS LEARNED
(BUTTON 1.5)

COST EFFECTIVE

NEED RELEVANT COURSES THROUGH REAL-TIME TELE-EDUCATION TECHNOLOGY AND ON-SITE CLASSROOM DELIVERY TO TRAIN LEADERS OF TOMORROW

PD21 SOLUTION: COST EFFECTIVENESS SHOULD BE MEASURED IN SEVERAL WAYS:

- DEVELOPMENT OF SKILLS TO REDUCE PRODUCT DEVELOPMENT TIME
 - FLEET PRODUCTS QUICKER AND MORE EFFECTIVELY
- PD21 IS PART OF A CONSORTIUM (MIT; UNIVERSITY OF DETROIT, MERCY; RIT; CIPD)
- MINIMAL TIME AWAY FROM DUTY OF RECORD
- PROGRAM MODIFICATION TO MEET THE NEEDS OF THE SPONSORING COMMANDS
 - CURRENTLY UNDER INVESTIGATION IS THE POSSIBILITY OF INCLUSION OF A SYSTEM ENGINEERING TRACK

LESSONS LEARNED
(BUTTON 1.6)

LEARNING BEYOND THE CLASSROOM

NEED TO PRACTICE APPLYING INSTRUCTION TO REAL WORLD NEEDS

PD21 SOLUTION: STUDENTS HAVE BEEN RECOGNIZED BY ONR (OFFICE OF NAVAL RESEARCH) AS FUTURE LEADERS AND HAVE BEEN INVITED TO PARTICIPATE IN THE 2ND ANNUAL NAVY/INDUSTRY R&D CONFERENCE, AUGUST 2001, WORKING TO FLEET PRODUCTS FASTER AND SMARTER

LESSONS LEARNED (BUTTON 2.1)

COMMUNICATION

NEED TO COMMUNICATE KNOWLEDGE AND IDEAS ACROSS DISTANCE
IN A MANNER THAT MOST CLOSELY APPROXIMATES A RESIDENTIAL
EDUCATION ENVIRONMENT

PD21 SOLUTION:

- PROTOCOL INFORMALLY ESTABLISHED BY STUDENTS FOR QUESTIONS/COMMENTS TO MAINTAIN SPONTANEITY DURING COURSE PRESENTATIONS (E.G. MUTE AFTER SPEAKING TO CUE END OF COMMENT)
- PROVIDE ALTERNATIVE MEANS FOR COMMUNICATING
 - E-MAIL
 - TELECONFERENCING
 - COURSE WEB-SITE
- ENCOURAGE VIRTUAL TEAM MEMBER COHESION TO COMPENSATE FOR DEPENDENCY ON TECHNOLOGY, LOSS OF VISUAL CUES
- CLASS SITE VISITS TO OBSERVE BEST BUSINESS PRACTICES AND TO PROVIDE INTERACTION OPPORTUNITIES

LESSONS LEARNED (BUTTON 2.2)

CULTURAL

NEED CONTINUOUS ASSESSMENT OF INFORMATION DELIVERY TO ENSURE HIGH QUALITY EDUCATION THROUGH A LESS FAMILIAR LEARNING FORMAT - FACILITATE STUDENT ADAPTATION TO CHANGING METHODS FOR LEARNING.

PD21 SOLUTION: PD21 DOOR IS ALWAYS OPEN TO INPUT

- STUDENT INPUT IS SOLICITED THROUGH THE WEB-BASED COURSE SITE, E-MAIL, AND STUDENT OPINION FORMS FOR EACH COURSE
- PROFESSORS RECEIVE AND RESPOND TO STUDENT REQUESTS IN CONJUNCTION WITH PROGRAM OFFICE
 - RETURN CLASS MATERIALS VIA MAIL WHEN E-DISTRIBUTION IS NOT POSSIBLE
 - PROVIDE COURSE MATERIALS VIA CLASS WEB SITE
- ORGANIZATIONAL COMMITMENT - BOTH FROM SPONSORS AND NAVAL POSTGRADUATE SCHOOL

LESSONS LEARNED (BUTTON 2.3)

TECHNICAL

NEED TO PROVIDE THE BEST COMMUNICATION TECHNOLOGY AVAILABLE TO ENSURE THE LEVEL OF BOTH THE INFORMATION AND THE PHYSICAL NUANCES (FACIAL EXPRESSIONS, HAND MOVEMENTS, VOICE INFLECTION) APPROACH THAT AVAILABLE IN A TRADITIONAL CLASSROOM SETTING

PD21 SOLUTION: UPGRADE ISDN LINES (HIGH SPEED INTERNET LINES WHEN AVAILABLE TO AREA) AND MORE EFFICIENT USE OF AVAILABLE COMMUNICATION BANDWIDTH:

- MAXIMIZE VISUAL RECEPTION DURING BROADCAST THROUGH
 - COORDINATION OF MULTI-SITE SIGN ON
 - ALL SITES OPERATING AT SAME SPEED
 - USE OF AUTO-FOCUS CAMERAS
 - USE OF GREEN BACKGROUND (SINGLE, SOLID COLOR AIDS AUTOFOCUS)
 - FULL SCREEN FOR DISPLAY OF COURSE MATERIALS
 - SPECIFYING BEST CLOTHING COLOR FOR SPEAKERS
- CONTINGENCY PLANNING THROUGH
 - TAPING SESSIONS AT BOTH NPS AND REMOTE SITES
 - FILE SHARING ON COURSE WEB SITE (POTENTIAL POWER OUTAGES AT ONE LOCATION CAN RESTRICT EFFICIENT USE OF CLASS TIME)
- CONTINUOUS ASSESSMENT OF POTENTIAL TECHNICAL UPGRADES TO ALL ASPECTS OF THE INFORMATION DELIVERY SYSTEM

LESSONS LEARNED
(BUTTON 3.1)

STUDENT OPINION FORMS EXCERPTS:

NEED, IDENTIFIED FROM THE FIRST QUARTER, FOR A WEB-BASED CLASS SITE TO FACILITATE TRANSFER OF INFORMATION

PD21 SOLUTION: IN NOVEMBER 2000 COURSEINFO WAS ADAPTED AS A CLASS INFORMATION MANAGEMENT TOOL

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NEED, IDENTIFIED FROM THE FIRST QUARTER, TO ESTABLISH A COMMUNICATION PROTOCOL AMONG THE STUDENTS/PROFESSOR

PD21 SOLUTION: IMPROVEMENT IN VTC LINES TO ALLOW FOR FASTER TRANSMISSION SPEEDS. COMMUNICATION ENABLERS:

- BETTER PICTURE FACILITATES READABILITY OF SLIDES/PRESENTATION MATERIALS, AND PHYSICAL CUES OF CLASSMATES
 - HAVE PROFESSOR USE 'FULL-SCREEN' FEATURE FOR MATERIALS/BLACKBOARD NOTES
- BETTER RELIABILITY
- REDUCED LINE DROP-OUTS
- USE OF GREEN BACKGROUND
- AUTOFOCUS CAMERA

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NEED SOME RELIEF FROM WORKLOAD/COURSELOAD

PD21 SOLUTION: WHEN POSSIBLE CLASS PROJECTS INCORPORATE WORK TASKS; SIDE BENEFIT IS ADDITIONAL APPLICABILITY OF COURSE WORK TO REAL TASKING

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NEED COURSE MATERIALS AVAILABLE SOONER IN
SMALLEST SIZE FORMAT POSSIBLE AND CONSIST ACROSS
COURSES

PD21 SOLUTION: PROVIDING TEXT MANIPULABLE FILES
VIA COUSE WEB SITE WHILE INVESTIGATING NEED FOR
STANDARDIZATION

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NEED VIRTUAL HANDRAISING METHOD DURING CLASSES

PD21 SOLUTION: WORKING ON THIS

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LESSONS LEARNED
(BUTTON 3.2)

STUDENT COMMENTS:

(QUOTE FROM DISCUSSION BOARD)

"...the first week was simply outstanding and had all the right flavor and perspective of a program that was special and targeted at a specific critical need within the Navy. We touched on the entire life cycle of product development including R&D."

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(QUOTE FROM STUDENT SYSTEM ARCHITECTING PROJECT)

"In all. The PD21 Information system has fulfilled my personal requirements for learning and exchanging valuable ideas for student development. Although not as effective as the classroom, VTC has fulfilled the basic requirement of student/instructor interaction and just as important, has allowed me to continue to manage work and family by not having to personally attend class at NPS."

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(QUOTE FROM REGARDING SYSTEM ENGINEERING)

"I really enjoyed the class and I was able to apply it immediately to my work..."

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(QUOTES FROM SYSTEM ENGINEERING SOF)

"... course has provided significant and valuable insight, and stressed importance of 'getting the right requirements'... I certainly appreciate the course and would recommend it to anyone."

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"Professor Orin's passion for System Engineering really came through in class and perhaps one of the underlying reasons for such a well structured course."

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(QUOTES FROM FINANCE AND MANAGERIAL ACCOUNTING SOF)

"I learned a considerable amount of new concepts I never even dreamed existed before. Good class and great instructor."

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"I thought the FAMA course was excellent. It was the perfect balance of # of concepts, depth of concept and workload."

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"Doug was a great instructor who took an interest in his students."

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(QUOTE FROM ORGANIZATION PROCESS SOF)

"The class was very intellectually stimulating,..."

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"Course provided an excellent application oriented approach to state-of-the art in the discipline."

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"... the instructor Alice Crawford and the technical staff at NPS met the challenge and in doing so has set a new 'high-water' mark in preparing the students for real life situations through teaching in that same, not so perfect environment."